

**RECEIVED
CENTRAL FAX CENTER**

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Scr. No. 10/518,563

AMENDMENTS TO THE CLAIMS:

Please replace the claims with the claims provided in the listing below wherein status, amendments, additions and cancellations are indicated.

1. (Currently Amended) A bearing apparatus ~~for supporting a pinion shaft,~~
comprising:

a case;

a pinion shaft having a pinion gear at a first end and a companion flange at
a second end;

a pair of rolling bearings which rotatably support ~~[[a]]~~ the pinion shaft to
~~[[a]]~~ the case and are arranged side by side in a shaft direction between ~~[[a]]~~ the
pinion gear ~~arranged at one end of said pinion shaft~~ and ~~[[a]]~~ the companion flange
~~attached outside the other end thereof;~~ ;

~~wherein~~ the rolling bearing on the companion flange side ~~comprises~~ being
an angular ball bearing comprising an inner ring fixed to said pinion shaft, an outer
ring fixed to said case, and a set of balls interposed between ~~these~~ the inner ring
and ~~the~~ the outer ring ~~ring~~ ring ~~[[.]]~~ ;

said companion flange applying a preload in an axial direction to said
angular ball bearing via the inner ring;

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said inner ring having an inner ring raceway, the outer ring having an outer ring raceway, and the balls having a ball diameter Bd;
and

wherein a relationship between a radius of curvature Ri of ~~[[an]]~~ the inner ring raceway, a radius of curvature Ro of ~~[[an]]~~ the outer ring raceway, and ~~[[a]]~~ the ball diameter Bd of the rolling bearing on the companion flange side satisfies

$$R_i < R_o$$

$$0.502 \times B_d \leq R_i \leq 0.512 \times B_d, \text{ and}$$

$$0.510 \times B_d \leq R_o \leq 0.520 \times B_d.$$

2. (Currently Amended) The bearing apparatus ~~for supporting the pinion shaft~~ according to claim 1, wherein a contact angle θ between the ball and the inner and outer ring raceways in the rolling bearing on the companion flange side satisfies $30^\circ \leq \theta < 45^\circ$.

3. (Currently Amended) The bearing apparatus ~~for supporting the pinion shaft~~ according to claim 1, wherein the rolling bearing on the companion flange

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side includes an angular contact ball bearing with single raceway or a tandem type angular contact ball bearing with double raceway.

4. (Withdrawn - Currently Amended) The bearing apparatus ~~for supporting the pinion shaft~~ according to claim 3, wherein the rolling bearing on a pinion shaft side includes a circular cone rolling bearing with single raceway:

5. (Currently Amended) The bearing apparatus ~~for supporting the pinion shaft~~ according to claim 3, wherein the rolling bearing on ~~[[the]]~~ a pinion side of said pinion shaft side ~~includes the~~ is a tandem type angular contact ball bearing with double raceway.

6. (Withdrawn - Currently Amended) The bearing apparatus ~~for supporting the pinion shaft~~ according to claim 3, wherein the rolling bearings on ~~[[the]]~~ a pinion side of said pinion shaft ~~[[side]]~~ includes a combination of two angular contact ball bearings with single raceway.

7. (Withdrawn) A bearing unit for supporting a pinion shaft to a differential retaining shield, comprising:

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a rolling bearing comprising an angular contact ball bearing with single raceway on a companion flange side; and

a rolling bearing comprising a tandem type angular contact ball bearing with double raceway on a pinion gear side,

wherein both of the rolling bearings commonly comprise an outer ring as a single outer ring and

wherein a relationship between a radius of curvature R_i of an inner ring raceway, a radius of curvature R_o of an outer ring raceway, and a ball diameter B_d of the rolling bearing on the companion flange side satisfies

$$R_i < R_o$$

$$0.502 \times B_d \leq R_i \leq 0.512 \times B_d, \text{ and}$$

$$0.510 \times B_d \leq R_o \leq 0.520 \times B_d.$$

8. (New) The bearing apparatus according to claim 1 wherein the radius of curvature R_o is larger than the radius of curvature R_i by about 1% of the ball diameter B_d .

9. (New) The bearing apparatus according to claim 2 wherein the radius of curvature R_o is larger than the radius of curvature R_i by about 1% of the ball diameter B_d .

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10. (New) The bearing apparatus according to claim 3 wherein the radius of curvature R_o is larger than the radius of curvature R_i by about 1% of the ball diameter B_d .

11. (New) The bearing apparatus according to claim 4 wherein the radius of curvature R_o is larger than the radius of curvature R_i by about 1% of the ball diameter B_d .

12. (New) The bearing apparatus according to claim 5 wherein the radius of curvature R_o is larger than the radius of curvature R_i by about 1% of the ball diameter B_d .